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10/689,382	10/20/2003	Mark Beaumont	DB001064-000	4144

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PITTSBURGH, PA 15219-2502

EXAMINER
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WAI, ERIC CHARLES

ART UNIT	PAPER NUMBER
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2195

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08/24/2007

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.



## Office Action Summary

Application No.

10/689,382

Applicant(s)

BEAUMONT, MARK

Examiner

Eric C. Wai

Art Unit

2195

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 20 October 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-12 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-12 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 20 October 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date 1/7/04, 10/20/03
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_



### DETAILED ACTION

1. Claims 1-12 are presented for examination.

#### ***Information Disclosure Statement***

2. The information disclosure statement filed 10/20/2003 fails to comply with 37 CFR 1.98(a)(2), which requires a legible copy of each cited foreign patent document; each non-patent literature publication or that portion which caused it to be listed; and all other information or that portion which caused it to be listed. It has been placed in the application file, but the information referred to therein has not been considered.

#### ***Double Patenting***

3. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.



Art Unit: 2195

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

4. Claims 1-7, 9 and 12 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1, 4-6, 12, 14-15, and 21 of copending Application No. 10/689,335.

5. Although the conflicting claims are not identical, they are not patentably distinct from each other. For instance, claim 1 of copending Application No. 10/689,335 recites the same step as claim 1 of the present application ("calculating a local mean number of tasks within each of said plurality of processing elements"). Claims 4-6 of copending Application No. 10/689,335 recite further limitations that are similar to claims 1-6 of the present application. It would have been obvious to one of ordinary skill to claim just the method to calculate the local mean number of tasks. One would be motivated by the desire to apply such a calculation to a variety of applications.

6. This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

7. Claims 1-7, 9 and 12 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1, 4-6, 12, 14-15, and 20 of copending Application No. 10/689,336.

8. Although the conflicting claims are not identical, they are not patentably distinct from each other. For instance, claim 1 of copending Application No. 10/689,336 recites



the same step as claim 1 of the present application ("calculating a local mean number of tasks within each of said plurality of processing elements"). Claims 4-6 of copending Application No. 10/689,336 recite further limitations that are similar to claims 1-6 of the present application. It would have been obvious to one of ordinary skill to claim just the method to calculate the local mean number of tasks. One would be motivated by the desire to apply such a calculation to a variety of applications.

9. This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

10. Claims 1-7, 9 and 12 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1, 4-6, 11, 13-14, and 20 of copending Application No. 10/689,312.

11. Although the conflicting claims are not identical, they are not patentably distinct from each other. For instance, claim 1 of copending Application No. 10/689, 312 recites the same step as claim 1 of the present application ("calculating a local mean number of tasks within each of said plurality of processing elements"). Claims 4-6 of copending Application No. 10/689, 312 recite further limitations that are similar to claims 1-6 of the present application. It would have been obvious to one of ordinary skill to claim just the method to calculate the local mean number of tasks. One would be motivated by the desire to apply such a calculation to a variety of applications.

12. This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.



***Claim Rejections - 35 USC § 101***

13. 35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

14. Claims 1-12 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter.

15. While claim 1 claims a method, the claim is so broad and sweeping as to preempt substantially every practical application of the idea embodied by the mathematical constructs of the claim. See MPEP 2106 (Accordingly, one may not patent every "substantial practical application" of an idea, law of nature or natural phenomena because such a patent would "in practical effect be a patent on the [idea, law of nature or natural phenomena] itself." *Gottschalk v. Benson*, 409 U.S. 63, 71-72, 175 USPQ 673, 676 (1972).)

16. Claim 1 is also rejected for failing to provide a useful, concrete and tangible result. Claim 1 recites the step of "assigning a value ( $E_r$ ) to said each processing element". However, no clear objective guidance is provided as to how that value is assigned. Therefore, concrete results are not provided on the basis of the claim language.



***Claim Rejections - 35 USC § 112***

17. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

18. Claims 5-6 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

a. The following terms are not clearly understood in the claims:

i. Claim 5 recites, "wherein  $E_r$  controls said *Trunc* function." It is unclear how  $E_r$  'controls' the function. Furthermore, it is unclear how this step is possible since each  $E_r$  value is set ahead of time and must be different for each processing element as stated in claim 4.

ii. Claim 6 recites, "is equal to one of  $X$  and  $(X+1)$ ". It is unclear what is meant by this.

***Claim Rejections - 35 USC § 103***

19. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

20. Claims 1-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Vignes et al. (US Pat No. 4,386,413 hereinafter Vignes).



21. Regarding claim 1, Vignes teaches a method used to control the accuracy in performing a computer calculation. Vignes' method utilizes a truncation or rounding off of the end result since the representation of numbers in a computer is effected by means of a finite number of storage bits. Vignes teaches that such methods can create results that are "vitiating by error" since they are approximations of the actual results (col 1 lines 18-27).

22. Vignes does not teach assigning a value, summing a total number of tasks and said value, and dividing the sum of said total number of tasks present on said parallel processing system and said value by a total number of processing elements.

23. However, it is also well known in the art to that an arithmetic mean calculation is defined as "The value obtained by dividing the sum of a set of quantities by the number of quantities in the set" (The American Heritage Dictionary of the English Language, Fourth Edition, 2006, Houghton Mifflin Company).

24. It would have been obvious to one of ordinary skill in the art at the time of the invention, to incorporate the teachings of Vignes to perform a local mean calculation. Vignes teaches that the representation of numbers in a computer is effected by means of a finite number of significant figures, which brings about a loss of accuracy (col 1 lines 18-20). The skilled artisan would have known to apply a value to the numerator of the arithmetic mean calculation. The skilled artisan would be motivated by the desire to ensure that the end result was accurate after the truncation is performed.



Art Unit: 2195

25. Regarding claim 2, Vignes does not teach that assigning a value ( $E_r$ ) to said each processing element ( $PE_r$ ) comprises setting said value ( $E_r$ ) equal to a number between 0 and  $(N-1)$ , where  $N$  represents said total number of processing elements in said parallel processing system.

26. It would have been obvious to one of ordinary skill in the art at the time of the invention to also include a parameter to account for processing elements that have more processing capability. One would be motivated by the desire to ensure an equitable distribution.

27. Regarding claim 3, Vignes does not teach that said assigning a value ( $E_r$ ) to said each processing element ( $PE_r$ ) further comprises giving a unique number to said each value ( $E_r$ ) for said each processing element  $PE_r$ .

28. It would have been obvious to one of ordinary skill in the art at the time of the invention that each processing element would be given a separate number.

29. Regarding claim 4, Vignes does not teach that said assigning a value ( $E_r$ ) to said each processing element ( $PE_r$ ) comprises setting said value ( $E_r$ ) equal to said number for a selected processing element ( $r$ ).

30. It would have been obvious to one of ordinary skill in the art at the time of the invention that each processing element would be given a number corresponding to its index.



Art Unit: 2195

31. . Regarding claim 5, Vignes does not teach that said value ( $E_r$ ) controls said truncating step such that said total number of tasks for said parallel processing system equals the sum of said local mean number of tasks for each processing element ( $PE_r$ ) in said parallel processing system.

32. It would have been obvious to one of ordinary skill in the art at the time of the invention to change the value of  $E_r$ . One would be motivated by the desire to ensure that the sum of the local mean values do not exceed the total number of tasks.

33. Regarding claim 6, Vignes does not teach that said local mean number of tasks for each processing element ( $PE_r$ ) within said parallel processing system is equal to one of  $X$  and  $(X+1)$ .

34. It would have been obvious to one of ordinary skill in the art at the time of the invention that the local mean for each processing element within said parallel processing system is equal to one of  $X$  and  $(X+1)$ .

35. Regarding claims 7-11, Vignes does not teach that said assigning step, said summing step, said dividing step, and said truncating step are completed on a portion, a line, a loop, an array, or an array of two or more interconnected processing elements within said parallel processing system.

36. It would have been obvious to one of ordinary skill in the art at the time of the invention to perform the method of claim on various different arrangements of



Art Unit: 2195

processing elements. One would be motivated by the desire to extend the breadth of the invention.

37. Regarding claim 12, it is the memory device claim of claim 1 above. Therefore, it is rejected for the same reasons as claim 1 above.

### ***Conclusion***

38. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Eric C. Wai whose telephone number is 571-270-1012. The examiner can normally be reached on Mon-Thurs, 9am-5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Meng - Ai An can be reached on 571-272-3756. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.



Art Unit: 2195

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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